

REMARKS

The Examiner's careful consideration and detailed comments in the Advisory Action dated October 20, 2003 ("AA") is acknowledged and appreciated.

As a preliminary matter, if the Examiner decides that claims 11 and claims 15,19 are patentably distinct so as to justify a restriction requirement, in order to expedite prosecution, Applicant would agree to elect without traverse claims 11-14 and 24-26 for further prosecution in this application and reserves the right to prosecute claims 15-17, 19-23, 27, 31 and 32, in a divisional application.

On page 2, lines 3-4 of the AA, the Examiner indicated that the amendment to claim 11 would be entered if filed without new claims 31-32. Accordingly, the enclosed amendment removes new claims 31-32 so as to obtain entrance and consideration thereof.

Further, it appears that the Examiner has indicated that the amendment to claim 11 would overcome the pending rejection thereto. In particular, the Examiner has checked box 3 of the AA indicating that the previous After-Final amendment overcomes a pending rejection, but does not indicate precisely which rejection was overcome. However, only claim 11 was amended and the Examiner set forth remarks in the AA which maintained the pending rejection against un-amended claims 15,19 and claim 11 without the amendment (relying on a different interpretation of "flatten", rather than alleging that Molnar discloses reduced bowing), leaving only the pending rejection against claim 11 as the rejection which would be overcome by the amendment thereto.

For the foregoing reasons, it is Applicant's belief that the AA indicates that the enclosed amendment would be entered and considered, and that the pending rejection

against claim 11 would be withdrawn, such a determination being earnestly solicited by Applicant.

Claim 11 requires that initial bowing exhibited by the layered substrate be reduced by growing an epitaxial layer so that the layered substrate exhibits less bowing (or eliminates bowing altogether; as shown in exemplary form, for example, in Figure 2C of Applicant's drawings) than the initial bowing exhibited by the layered substrate before the epitaxial layer was grown thereon. Additional support for such a feature can be found, for example, at page 10, lines 21-26 of Applicant's specification.

It is respectfully submitted that Molnar does not disclose claim 11 for the reasons previously made of record, and neither Hansson nor Westmoreland used to reject claims 15 and 19 suggest reducing bowing nor indicate how to determine the requisite parameters needed to do so. As illustrated, for example, in Figure 2C of Applicant's drawings, reducing the bowing in the layered substrate depends on many variables such as the materials, relative thermal coefficients, relative thicknesses, processing parameters, etc..

The cited prior art is silent as to bowing, let alone the needed parameters to reduce the bowing. Only Applicant has considered the bowing problem and determined the needed parameters to enable a reduction in bowing. The present invention provides a layered substrate for purposely creating an initial bowing which can then be reduced by growing epitaxial layers which counter-act the initial bowing so that the *resulting* bowing is reduced. There is no suggestion or motivation from the cited prior art for controlling the required parameters so that epitaxial growth will reduce the initial bowing. Indeed, as evidenced by Figure 2C of Applicant's drawings, bowing can quite easily be *increased* relative to an initial bowing depending on the various parameters.

The Examiner's remarks regarding claims 15 and 19 beginning on page 4, line 6 of the AA are respectfully traversed for the following reasons. The Examiner alleges that although "Westmoreland teaches other methods of performing the pulsed heating, ... Westmoreland does disclose a heating source located in the reaction chamber to perform the pulsed heating, which improves the deposition of reactant gases over a narrow temperature range."

It is respectfully submitted that the improved deposition of Westmoreland is NOT attributable to the alleged direct heating. Instead, the improved deposition is attributed to the pulsed heating regardless of whether direct heating is used or the "other methods of performing pulsed heating" are used. It is respectfully submitted that the Examiner must provide requisite motivation under § 103 to make the *particular* modification to Molnar rather than rely on a motivation derived from a feature independent of the proposed modification. In the instant case, the Examiner's asserted motivation of improving deposition is derived from pulsed heating rather than direct heating. Westmoreland discloses the alleged direct heating only incidentally and provides no motivation for its application *over* other heating methods. The Examiner has not provided objective evidence from the prior art that suggests the desirability specifically of direct heating. In contrast, Molnar teaches away from suggesting the desirability of direct heating by suggesting other methods can be used to obtain the same improved deposition.

Further, the Examiner alleges that "Westmoreland is not limited to the deposition into vias." However, even assuming the *claimed* invention in Westmoreland is not limited to deposition into vias, the disclosed motivation derived from Westmoreland to use pulsed heating is based on depositing into vias so that applying the teachings of

Westmoreland to a primary reference under § 103 would at least require the primary reference to have the vias. The object of Westmoreland is to conformally deposit a conducting material into contact vias. Westmoreland does so by using rapid thermal pulses to alternately deposit and diffuse a deposition gas over and into the deep recesses of a semiconductor structure whereby during interruption of heat the deposition gas diffuses thoroughly (*see, e.g.*, col. 2, lines 30-42; col. 4, lines 5-66 of Westmoreland). As there are no contact vias in the growth method disclosed by Hansson, such a pulsed heating disclosed by Westmoreland is not relevant to Hansson in addition to the fact that Westmoreland does not provide any motivation for using a heat source within the process chamber *per se*.

For the foregoing reasons, it is respectfully submitted that the proposed combination of Hansson in view of Westmoreland is improper.

CONCLUSION

Having fully and completely responded to the Office Action, Applicant submits that all of the claims are now in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicant's attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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